

CLAIMS

1. A method of producing coated diamond particles includes the steps of providing a combination of a transition metal selected from zirconium, hafnium, niobium and tantalum, an activation metal and uncoated diamond particles, and heat treating the combination in a non-oxidising atmosphere to cause the activation metal to bond to the diamond particles and the transition metal to form a carbide coating on the diamond particles.
2. A method according to claim 1 wherein the transition metal is in particulate form.
3. A method according to claim 1 or claim 2 wherein the transition metal is in mesh, sheet or layer form.
4. A method according to any one of claims 1 to 3 wherein the activation metal is in particulate form.
5. A method according to claim 1 wherein the transition metal and activation metal are in particulate form and the combination is a particulate mass.
6. A method according to any of the preceding claims wherein the activation metal is in an amount of no more than 2% by weight of the transition metal and activation metal.
7. A method according to any one of claims 1 to 5 wherein the activation metal is present in an amount of no more than 0,2% by weight of the transition metal and activation metal.

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8. A method according to any one of the preceding claims wherein the heat treatment takes place in the presence of a gaseous halide.
9. A method according to claim 8 wherein the gaseous halide is gaseous chloride.
10. A method according to claim 8 or claim 9 wherein the gaseous halide is produced *in situ* from a halide which volatilises under the conditions of heat treatment.
11. A method according to claim 10 wherein the halide which volatilises under the conditions of heat treatment is an ammonium halide.
12. A method according to claim 11 wherein the ammonium halide is ammonium chloride.
13. A method according to any one of the preceding claims wherein the heat treatment takes place at a temperature of at least 800°C.
14. A method according to any one of the preceding claims wherein the period of heat treatment is one to four hours.
15. A method according to any one of the preceding claims wherein the activation metal is selected from titanium, vanadium and chromium.
16. A method according to claim 15 wherein the activation metal is chromium.
17. A method according to any one of the preceding claims wherein the transition metal is tantalum.

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18. A method according to any one of the preceding claims wherein the activation metal bonded to the diamond covers a portion only of the surface of the diamond.
19. A coated diamond particle wherein the coating comprises an activation metal bonded to the diamond surface and a layer, completely enclosing the diamond particle, of a carbide of a transition metal selected from zirconium, hafnium, niobium and tantalum.
20. A coated diamond particle according to claim 19 wherein the activation metal covers a portion only of the diamond surface.
21. A coated diamond according to claim 19 or claim 20 wherein the transition metal is tantalum.
22. A coated diamond according to any one of claims 19 to 21 wherein the activation metal is selected from titanium, vanadium and chromium.
23. A coated diamond according to claim 22 wherein the activation metal is chromium.
24. A method of producing a metal coated diamond particle according to claim 1 and substantially as herein described with reference to any one of Examples 2 to 4, 6 and 7.
25. A coated diamond according to claim 16 substantially as herein described with reference to any one of Examples 2 to 4, 6 and 7.